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PREVENTION OPPORTUNITIES UNDER THE BIG SKY

THE MONTANA PUBLIC HEALTH LABORATORY: ESSENTIAL SERVICES FOR DIAGNOSIS AND SURVEILLANCE

The Montana Public Health Laboratory (MT-PHL) provides services to identify and confirm the cause of a wide variety of diseases, and plays an essential role in surveillance of conditions of public health importance. The laboratory detects new and emerging, as well as already well known diseases, documents water quality, and provides answers that support effective public health actions to protect Montanans. This issue of *Montana Public Health* describes the work of the MT-PHL.

Servicing Montana since 1917

In October 1917, the Montana state health department announced the opening of a public health laboratory: *"...the laboratory will be ready to receive specimens embracing the following: any cultures, smears, or material for smears, for bacteriological determination in the diagnosis of diphtheria, pneumonia, meningitis, tuberculosis, Neisserian infection, ophthalmia neonatorium, etc."* [1] The one-person staff at that time analyzed and reported (sometimes by telegram, sent "collect") about 100 tests per month. Today a staff of 35 persons performs and reports about 14,000 tests per month. Neither clinicians nor laboratorians in 1917 could have imagined the range and complexity of tests that would accompany dramatic scientific advances in the 20th century. Now laboratory tests provide evidence for viral, fungal, and parasitic as well as bacterial infections, detect inborn errors of metabolism in newborns, identify chemical contaminants in environmental samples, and accomplish this with remarkable sensitivity and specificity.

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What testing does the MT-PHL provide?

State public health laboratories often perform tests that are unavailable elsewhere, coming face-to-face with the microbes, environmental toxicants, and other substances that threaten the health of Montanans. From July 2005 through June 2006 the MT-PHL provided results of 165,377 tests (Table). These tests included: newborn screening (e.g., phenylketonuria, galactosemia, hypothyroidism), sexually transmitted infections (e.g., Chlamydia, gonorrhea, syphilis), serologies (e.g., rubella, hepatitis, HIV, Hantavirus, West Nile Virus) environmental chemistry (e.g., water tests for bacteria, metals, nitrates), microbiology (e.g., identification of bacteria, fungi, parasites, viruses, and tuberculosis), and molecular biology (e.g., pertussis and norovirus). Because many of these tests are complex, laboratory professionals from MT-PHL often provide consultation to support careful interpretations and decisions about alternate or confirmatory testing for both clinical and environmental specimens.

Table: Tests done at MT-PHL, July 2005 – June 2006

Test type	% (of 165,377 tests)
Newborn screening	44
Sexually Transmitted Infections	19
Environmental Chemistry	16
Serology	10
Microbiology	8
Molecular Biology	3
Total	100

Laboratory test results and disease surveillance
The purposes of disease surveillance include: monitoring the occurrence of reportable diseases; recognizing unusual occurrences of these diseases; and assessing the effect of disease control efforts. In addition, surveillance data are used to guide decisions about resource allocation for public health programs. Almost all reportable diseases in Montana require laboratory testing to confirm diagnosis.[2] Therefore, the MT-PHL along with clinical laboratories throughout the state provide the foundation for disease surveillance and control under the Big Sky.

The MT-PHL and outbreak investigation
During investigations of disease outbreaks and other unusual occurrences of illness the MT-PHL often provides timely, accurate information that leads to disease control. A few recent examples illustrate this vitally important service.

- (2007) DNA fingerprinting of a *Salmonella* isolate linked illness in a Montana patient to a nationwide peanut butter associated outbreak,
- (2006) identification of a TB organism and subsequent drug susceptibility testing identified a multi-drug resistant TB case in Montana [detection of this organism led to appropriate steps to treat the patient and prevent spread of this hard to treat infection],
- (2005) performing more than 100 PCR tests each day including Saturdays for two weeks supported the work of one county health department during a pertussis outbreak [every symptomatic middle and high school student in the county was tested and identified cases were treated appropriately].

Recommendation: Contact MT-PHL to learn about

- tests of public health significance, appropriate test selection, and specimen requirements
- the results of specific laboratory tests aggregated for statewide surveillance
- training and continuing education opportunities for laboratory professionals
- state-of-the-art test methods for diagnosis of emerging infectious diseases, or intentional bio- or chemical-terrorist threats.

For more information about the MT-PHL and its service, call 406-444-3444 or 800-821-7284.

References:
1. Secretary, Department of Public Health, letter to Montana physicians, October, 1917
2. DPHHS. Disease reporting: essential for disease control. *Montana Public Health* 2007;2:1

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